Remarks

Claims 1, 3-12, 16-19, and 25-37 are pending in the application after entry of the herein amendment. Reconsideration is requested in view of the above changes, and the following remarks.

Claims 2 and 23 have been cancelled without prejudice. Claim 25 has been amended to depend from claim 1. Claim 4 has been amended.

Notice of Petition Seeking Review of Lack of Unity Objection

A petition is filed herewith seeking review of (i) the finding of lack of unity as between Group I and Group III, the (ii) the withdrawal of claims 36 and 37 from consideration.

Response to 35 USC 112 Rejection

Claims 4 and 5 have been rejected as allegedly indefinite on the basis of the work "type" in claim 4. The term has been removed from claim 4, thereby overcoming the rejection.

Response to 35 USC 103 Rejections

The Examiner has rejected claims 1-5, 7-12, 16, 23, 25 as being unpatentable over Kaper in view of Burgoyne. Claim 1 is the sole independent claim. The Examiner provides his reasoning on why the combination of these two documents renders the instant claims obvious on pages 6-8 of the Detailed Action. However, the Examiner's summaries of what each of these documents teaches does not accord with the teachings of those documents. For the following reasons, Examiner has failed to sustain the burden of establishing that the bioadhesive pharmaceutical formulation of claim 1 would have been obvious to one of ordinary skill in the art at the time the invention was made.

With regards to Kaper, the Examiner states in the final paragraph of page 6 that this document teaches the use of β-limit dextrin ("BLD") as both an adhesive carrier or as both a carrier and a binder, referring to column 4, lines 13-19 of Kaper. However, this paragraph of Kaper merely teaches that BLDs can be used as carriers of dried liquids, such as fruit juices, soups, sauces, milk beverages, etc. There is no indication whatsoever in Kaper that BLD may be used as an adhesive carrier, let alone a mucoadhesive carrier.

With regards to Burgoyne, the Examiner acknowledges that this document does not teach the use of BLD, but that it describes various compositions which may include dextrin excipients. As with Kaper, Burgoyne does not provide any indication whatsoever that dextrins, let alone BLDs, can be used in bioadhesive pharmaceutical preparations, or that they can be used as mucoadhesive carriers, as required by the instant claims. Thus, the Examiner's statement to justify the objection under Section 103, *i.e.*, that "both Kaper and Burgoyne teach mucoadhesive wafer-like structures which comprise pharmaceutical active agents coupled with dextrin-based carriers and at least one additional carbohydrate component", is factually incorrect. Neither Kaper nor Burgoyne teach bioadhesive or mucoadhesive formulations, let alone a mucoadhesive wafer-like structure.

Indeed, the Examiner himself acknowledges in the first paragraph of page 7 of the Detailed Action that Kaper does not teach a wafer-like structure, contradicting his later statement in paragraph 3 of that page. With regards to the specific reference to chewing gum structures, chewing gums are not typically bioadhesive or mucoadhesive.

In summary, the uses suggested for BLD by Kaper do not include bioadhesive pharmaceutical formulations; there is no mention of bioadhesive formulations in which BLD is a mucoadhesive carrier, and there is no mention of wafer-like structures. Burgoyne does not refer to BLDs in any form, and makes no mention of bioadhesive or mucoadhesive formulations.

Moreover, the person of ordinary skill in the art would not consider employing a BLD in the composition as taught by Burgoyne, even with the knowledge of the teaching of Kaper. Burgoyne refers to the use of dextrins as excipients in pharmaceutical formulations. Although the term "dextrins" encompasses a huge range of chemical entities (indeed encompassing any depolymerized polysaccharide, e.g. produced by heat, acid, or enzyme treatment of starch), in the context of pharmaceutical excipients, it is well understood in the art that only a small range of dextrins will be suitable for use as pharmaceutical excipients, e.g., in solid dosage forms. Indeed, in such a context, the term "dextrin" is almost invariably understood to refer to maltodextrins, which are very soluble, of low molecular weight and easily released into solution. Moreover, it is known that only some maltodextrins will be suitable for such use. In contrast, BLDs are branched like amylopectins, are of higher molecular weight and are generally colloidal

in solution. BLDs are thus structurally more similar to pre-gelatinized starches, which themselves are generally not considered suitable for use as excipients in many pharmaceutical formulations. Thus, in the absence of the teaching of the present application of the particular advantages of BLD as a mucoadhesive and its surprising ability to facilitate the dissolution of drugs, the skilled person would not consider employing a BLD as the dextrin excipient in the pharmaceutical composition as taught by Burgoyne.

Moreover, even if the person of ordinary skill in the art were to modify the solid pharmaceutical dosage form practiced by Burgoyne using BLD as practiced by Kaper, all that would result would be a solid pharmaceutical dosage form comprising BLD, not a bioadhesive pharmaceutical formulation in which BLD is a mucoadhesive carrier, as required by the instant claims. Neither prior art document gives any teaching with regards to the use of bioadhesive formulations; the formulations of pharmaceutical products required for a bioadhesive delivery are, as is well known to the skilled artisan, different from to those as used in other drug delivery.

Accordingly, the bioadhesive pharmaceutical formulation of claim 1 would not have been obvious to one of ordinary skill in the art at the time the invention was made. Claim 1 is allowable.

Claims 3-12, 16 and 25 depend directly or indirectly from claim 1. In view of the allowability of claim 1, claims 3-12, 16 and 25 are likewise allowable.

Claims 11 and 12 further distinguish over the prior art, for the following reasons. Claims 11 and 12 define a formulation according to claim 1, further including an alginate in the amount of 1-50% (w/v) (claim 11) and 10-30% (w/v) (claim 12). These claimed alginate concentrations differ substantially from the concentrations of alginate that would typically be used when the alginate is employed as a disintegrating agent. The present application teaches that the properties of BLD, for example its mucoadhesive properties, can be improved by addition of other polysaccharides, such as alginate (see, for example pages 26-27 of the application as filed). Given the differences in the concentrations used for an alginate when employed as a disintegrating agent, and its concentration which enhances the mucoadhesive properties of BLD, the skilled person would receive no motivation whatsoever from Burgoyne, or any of the other cited documents, to optimize the alginate percentage to those claimed in present claims 11 and

12. Thus the skilled artisan, when optimizing a pharmaceutical formulation to include an alginate disintegrating agent, would not consider using such agents at the concentrations as claimed in the present claims 11 and 12. The advantage of alginate in enhancing the mucoadhesive limit properties of BLD was not known prior to the disclosure of the present application. The skilled artisan would only consider optimizing a pharmaceutical composition comprising BLD as a mucoadhesive carrier, and further including an alginate at the claimed concentrations, with knowledge of the teaching of the present application. This is impermissible hindsight.

Accordingly, claims 11 and 12 are further inventive over the prior art.

Conclusion

The claims remaining in the application are in condition for allowance. An early action toward that end is earnestly solicited.

Respectfully submitted,

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